CLAIMS

What is claimed is:

1. A medical device comprising:

a polymeric carrier fiber component, wherein the carrier fiber is capable of reversibly reacting with nitric oxide;

a nitric oxide predrug; and

a second fiber component, wherein said second fiber functions to sequester said predrug from reactive species.

2. The medical device of claim 1, wherein the medical device is selected from the group consisting of a vascular graft, a stent, a catheter, and a wound dressing.

3. The medical device of claim 1, wherein the polymeric carrier fiber component comprises at least one secondary amine moiety.

4. The medical device of claim 3, wherein the polymeric carrier fiber component is selected from the group consisting of a polyethyleneimine, a polyethyleneimine grafted to a polysaccharide backbone, and a polyethyleneimine salt.

5. The medical device of claim 3, wherein the polymeric carrier fiber component comprises a polyethyleneimine fiber.

6. The device of claim 3, wherein the polymeric carrier fiber component comprises an electrospun nanofiber.

7. The medical device of claim 1, wherein the nitric oxide predrug component is selected from the group consisting of a diazeniumdiolate, an O-alkylated diazeniumdiolate, and an O-derivatized diazeniumdiolate.

8. The medical device of claim 1, wherein the nitric oxide predrug component comprises a diazeniumdiolate.

9. The device of claim 1, further comprising an activator.

10. The device of claim 9, wherein the activator is a proton donor.

11. The device of claim 10, wherein the activator is a buffer selected from the group consisting of phosphates, succinates, carbonates, acetates, formates, propionates, butyrates, fatty acids, and amino acids.

12. The device of claim 10, wherein the activator is water.

13. The device of claim 1 further comprising a mobile phase.

14. The device of claim 13, wherein the mobile phase is capable of transporting an activator such that it contacts the nitric oxide predrug component.

15. The device of claim 14, wherein the mobile phase is selected from the group consisting of water, methanol, ethanol, propanols, butanols, pentanols, hexanols, phenols, naphthols, polyols, acetic acid, N,N-dimethylformamide, dimethyl sulfoxide, dimethylacetamide, and tetrahydrofuran, hexamethylphosphoramide.

16. The device of claim 1, wherein said second fiber is substantially hydrophobic.

17. The device of claim 1, wherein the second fiber is selected from the group consisting of polyurethane, polyamide, polyethylene, polypropylene, polyesters, saturated polyesters, polyethylene terephthalate, polytetrafluoroethylene, perfluoroethylene, polystyrene, polyvinyl chloride, and polyvinyl pyrolidone.

18. The device of claim 1, wherein the second fiber component imparts additional strength.

19. the device of claim 18, wherein the second fiber component imparts sufficient strength to permit the device to be free-standing devices without the assistance of a substrate.